What is claimed is:

1. An ultrasonic flow sensor, particularly for measuring the volume flow or mass flow of a fluid (1) that flows through a pipeline (3) and includes two ultrasonic converters (A,B) that are offset in the direction of flow (2) and each transmit a periodic ultrasonic signal (S1,S2) to the other ultrasonic converter (B,A), and a control and evaluation unit (4) that detects several reception times (t_i',t_i") per ultrasonic signal (S1,S2) when an ultrasonic signal (S1,S2) is received by one of the ultrasonic converters (A,B), a measured quantity (S) being determined from one of the reception times (t_i',t_i"), wherein the control and evaluation circuit (4) includes at least two counters (5a,5b), the first counter (5a) counting the full intervals ([t_i',t_{i+1}']) of a first signal (S2,P) at least until the first reception time (t_2") of an ultrasonic signal (S1), and the second counter (5b) determining a time interval (Δt") between a first switchover/reception time (A4) and a second switchover/reception time (B2) of the signals (S1,S2,P) out of several paired switchover/reception times (t_i',t_i").

2. The ultrasonic flow sensor as recited in Claim 1, wherein, in a first operating mode, the first signal (S2,P) is an ultrasonic signal (S2) that is sent out simultaneously with the other ultrasonic signal (S1), or, in a second operating mode, it is a reference signal (P) that is generated out of the same clock pulse as the ultrasonic signal (S1).

3. The ultrasonic flow sensor as recited in Claim 1 or 2, wherein each of the paired reception times (t_i', t_i") includes a switchover/reception time (Ai) of the signal (S2,P) and a subsequent reception time (Bi) of the ultrasonic signal (S1).

4. The ultrasonic flow sensor as recited in Claim 1, 2 or 3, wherein the control and evaluation circuit (4) checks to determine whether the first reception time (t_1") of the ultrasonic signal (S1) is temporally closer to the preceding (t_3') or

subsequent switchover/reception time (t_4') of the signal (S2,P) than a specified time threshold (t0), whereby, in the first case, the first counter (5a) counts the period ($\Delta t'$) from the first switchover/reception time (t_1') until the switchover/reception time (t_3') of the signal (S2,P) that precedes the reception time (t_1") of the ultrasonic signal (S1) and, in the other case, it counts until the switchover/reception time (t_4') that follows the first reception time (t_1") of the ultrasonic signal (S1).

5. The ultrasonic flow sensor as recited in one of the preceding Claims, wherein
the second counter (5b) is an up-down counter that counts either up or down, depending on a series of paired reception times (t_i',t_i") or (t_i",t_i').

6. The ultrasonic flow sensor as recited in Claim 5, wherein
the first counter (5a) is an up-down counter that can receive a positive or a negative carry-over from the second counter (5b).

7. The ultrasonic flow sensor as recited in one of the preceding Claims, wherein
the second counter accumulates the period ($\Delta t''$) of the intervals defined by p pairs of reception times (t_i',t_i"), p being a square number.

8. The ultrasonic flow sensor as recited in Claim 7, wherein,
after the period defined by p pairs of intervals is measured, the counter status of the second counter (5b) is averaged by performing a shift register operation, by eliminating binary places, or via a modified interpretation of the weight of the binary places.

9. A method for determining the transit time difference (Δt) between two ultrasonic signals (S1, S2) from an ultrasonic flow sensor with two ultrasonic converters (A,B) that are offset in the direction of flow (2) and each transmit an ultrasonic signal (S1,S2) to the other ultrasonic converter (B,A), and a control and evaluation circuit (4) that detects several reception times (t_i',t_i") per ultrasonic signal (S1,S2) when an ultrasonic signal (S1,S2) is received by one of the ultrasonic converters (A,B), a measured quantity (S)

being determined from one of the reception times (t_i',t_i"),
wherein,
using a first counter (5a), a period (Δt') of the full intervals ([t_i',t_{i+1}']) of a signal (S2,P) is counted at least until the first reception time (t_2") of an ultrasonic signal (S1), and, using a second counter (5b), the time intervals (Δt") between a first reception time and a second reception time out of several pairs reception times (t_i',t_i") being determined.

10. The method as recited in Claim 9,
wherein
the second counter (5b) measures the periods (Δt_i") between several paired instants (t_i', t_i"), each of which includes a switchover/reception time (t_i') of the signal (S2,P) and a reception time (t_i") of the ultrasonic signal (S1).

11. The method as recited in Claim 9 or 10,
wherein,
a check is carried out to determine whether the first reception time (t_1") of the ultrasonic signal (S1) is temporally closer to the preceding (t_3') or subsequent switchover/reception time (t_4') of the signal (S2,P) than a specified time threshold (t0) whereby, in the first case, the first counter (5a) counts the period (Δt') from the first switchover/reception time (t_1') until the switchover/reception time (t_3') of the signal (S2,P) that precedes the reception time (t_1") of the ultrasonic signal (S1) and, in the other case, it counts until the switchover/reception time (t_4') that follows the first reception time (t_1") of the ultrasonic signal (S1).

12. The method as recited in one of the Claims 9 through 11,
wherein
a digital signal from the evaluation circuit (4) that displays the receipt of a reception event (Ai, Bi) is sampled with a sampling signal, the frequency of which is markedly higher than the reciprocal of the temporal inaccuracy (Δt_j) of the signal (20).